蝶と蛾 *Trans. lepid. Soc. Japan* **50** (1): 17–34, January 1999

Euthalia agnis (Snellen van Vollenhoven) and *Euthalia tinna* Fruhstorfer (Rhopalocera, Nymphalidae), two distinct species

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Abstract Since Corbet (1941) showed the classification of *Euthalia agnis* (Snellen van Vollenhoven, 1862) (type locality: Java) and its related taxa, *agnis* and *tinna* Fruhstorfer, 1906 have been treated as a single species. Because the characteristics of the specimens from the Malay peninsula and Sumatra which we recently obtained are different from those of the Javanese specimens, the *agnis* complex should be treated as two species, *E. agnis* and *E. tinna*, as shown by Fruhstorfer (1906, 1913).

Key words *Euthalia, agniformis*, *agnis*, *canens* syn. nov., *hiyamai* ssp. nov., *modesta*, *paupera*, *tinna* sp. rev., Rhopalocera, Nymphalidae, holotype, lectotype, male genitalia, Indonesia, Borneo, Sumatra, Java, Malaysia, Thailand.

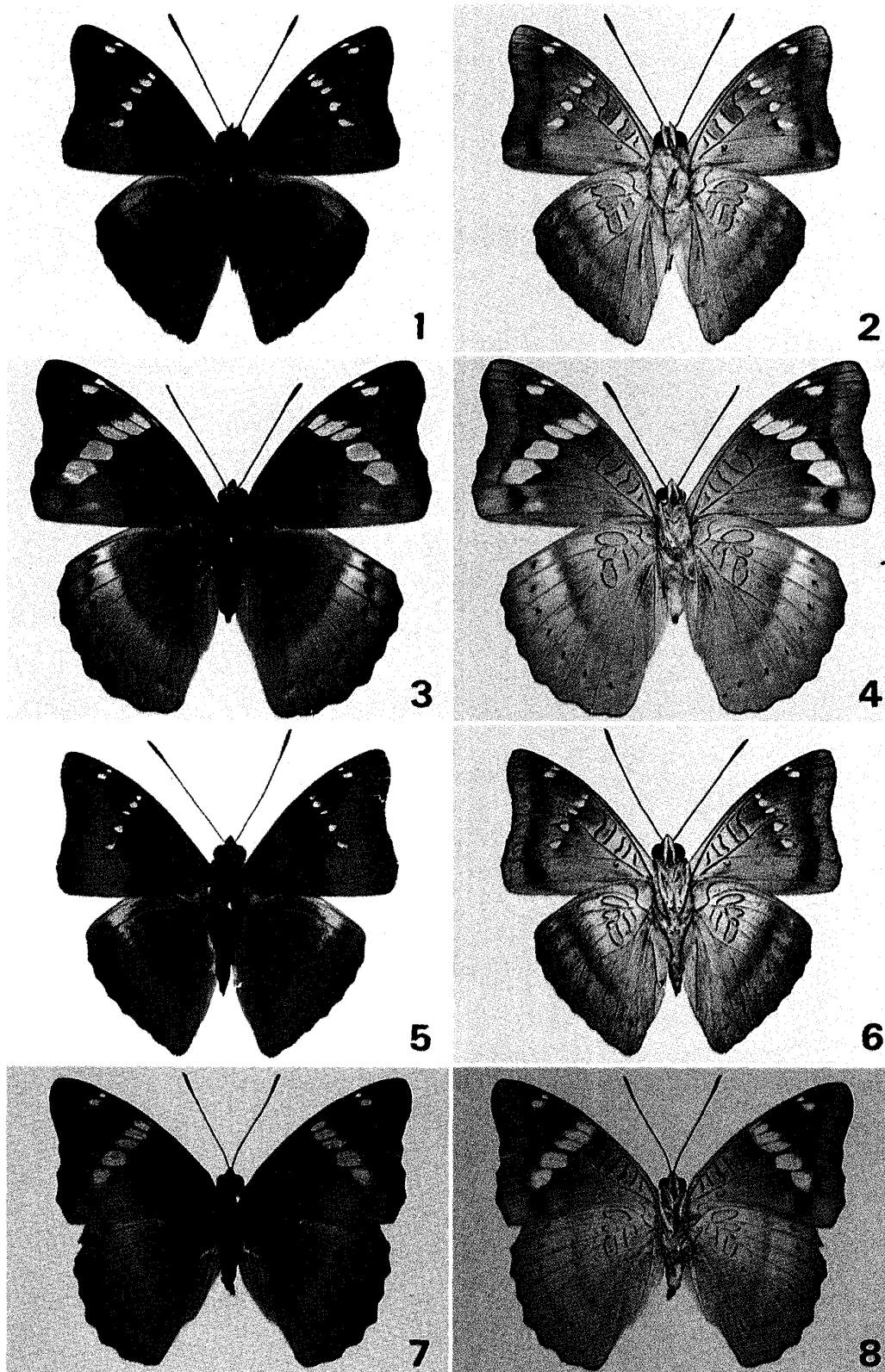
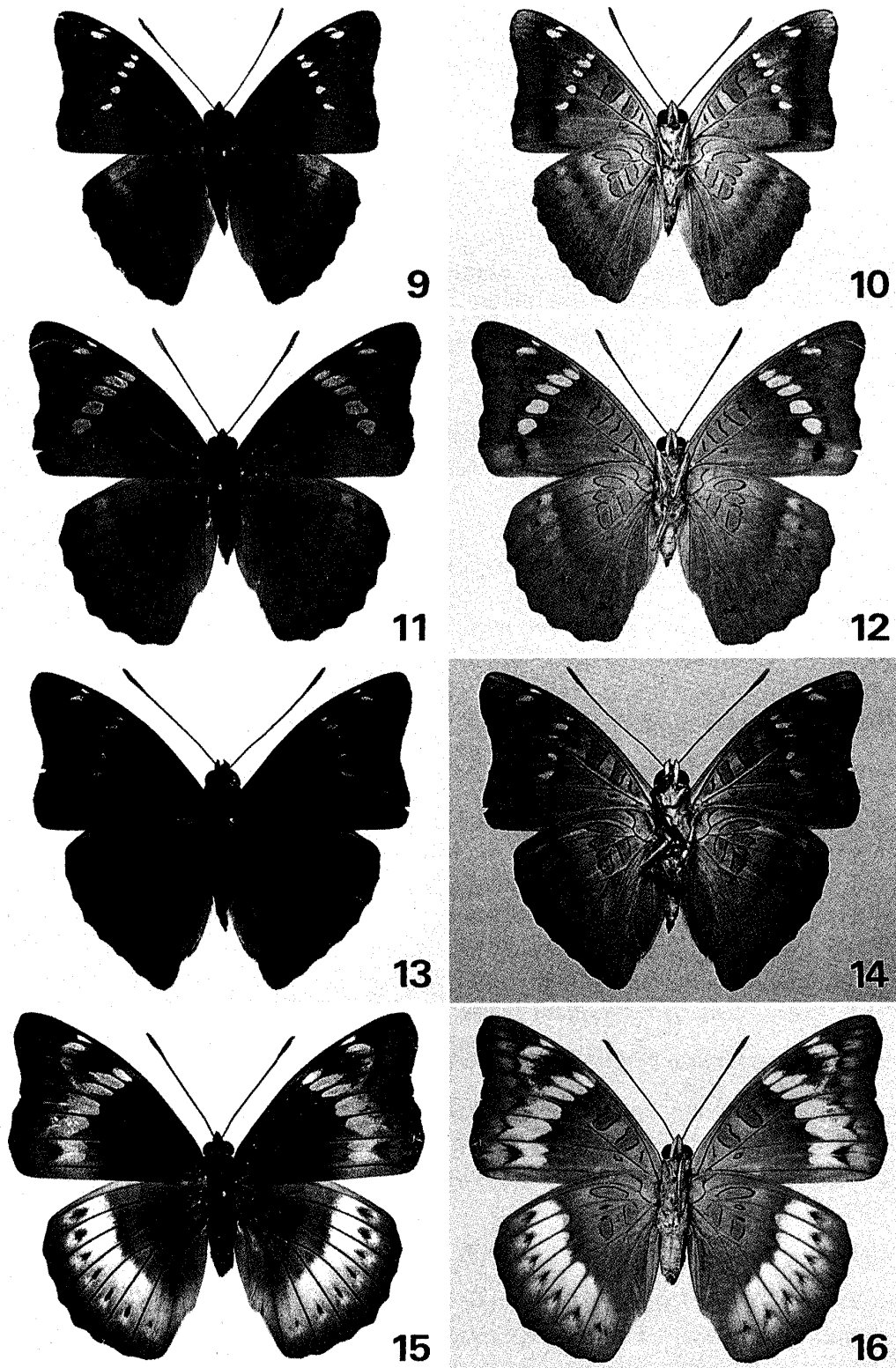
Introduction

According to Tsukada (1991), *Euthalia agnis* (Snellen van Vollenhoven, 1862) has been recorded from the Malay peninsula, Borneo, Sumatra and Java, and is a rare species in any locality. Recently some male specimens of the *agnis* complex similar to Bornean *tinna* Fruhstorfer, 1906 (hereafter referred to a *tinna*-type) were obtained from North and West Sumatra, and these were different from a Sumatran subspecies *modesta* Fruhstorfer, 1906 known before. Yokochi, one of the authors, preserves two males from the Malay peninsula: one is the *tinna*-type from S. Thailand, and the other from Cameron Highlands in Malaysia is similar to Javanese *agnis* (hereafter referred to an *agnis*-type). Therefore, both types are sympatrically distributed in Sumatra and the Malay peninsula.

We call the *agnis*-type and the *tinna*-type the *agnis* complex for sake of convenience in this paper, and revise here the classification of this complex on the basis of research on the type series preserved in The Museum National d'Histoire Naturalle Entomologie in Paris (MNHN), The Nationaal Naturhistorische Museum in Leiden (RMNH), The Natural History Museum in London (BMNH) and The Department of Zoology of the National University of Singapore (NUS).

Historical review of taxonomy in the *agnis* complex and designations of lectotypes

Six taxa of the *agnis* complex were described up to the present as follows (T. L.: type locality).

agniformis Fruhstorfer, 1906 (T. L.: Deli, Sumatra)
agnis Snellen van Vollenhoven, 1862 (T. L.: Java)
canens Tsukada, 1991 (T. L.: Mt Dempo, S. Sumatra)
modesta Fruhstorfer, 1906 (T. L.: Battak Mts, Sumatra)
paupera Fruhstorfer, 1906 (T. L.: the Malay peninsula)

Figs 1–8. *Euthalia* (*Euthalia*) *agnis* subspp. 1. *E. a. agnis*. W. Java, ♂, T. Yokochi collection. 2. *Ditto*, underside. 3. *E. a. agnis*. W. Java, ♀, T. Yokochi collection. 4. *Ditto*, underside. 5. *E. a. modesta*. N. Sumatra, ♂, T. Yokochi collection. 6. *Ditto*, underside. 7. *E. a. modesta*. N. Sumatra, lectotype ♀, MNHN. 8. *Ditto*, underside.

Figs 9–16. *Euthalia* (*Euthalia*) *agnis* and *E.* (*E.*) *tinna*. 9. *E. agnis hiyamai* ssp. nov. W. Malaysia, holotype ♂, now T. Yokochi collection. 10. *Ditto*, underside. 11. *E. agnis hiyamai* ssp. nov. W. Malaysia, paratype ♀, T. Yokochi collection. 12. *Ditto*, underside. 13. *E. tinna tinna*. N. Borneo, lectotype ♂, MNHN. 14. *Ditto*, underside. 15. *E. tinna tinna*. N. Borneo, ♀, T. Yokochi collection. 16. *Ditto*, underside.

tinna Fruhstorfer, 1906 (T. L.: Kinabalu, N. Borneo)

Descriptions of how the *agnis* complex has been treated taxonomically are as follows (refer to the synonymic list).

1. Snellen van Vollenhoven (1862)

Adolias agnis Snellen van Vollenhoven, 1862

Snellen van Vollenhoven (1862) described *agnis* from Java as the first taxon of this complex. A female was figured in the original description, but the number of specimens in the type series is unknown. Its type series is preserved in RMNH, and we examined them. The designation of the lectotype has not been done.

2. Fruhstorfer (1906)

Fruhstorfer described *tinna* and its two subspecies and one subspecies of *agnis* in 1906. This shows that he already recognized two species in this complex.

1) *Euthalia tinna* Fruhstorfer, 1906

Described based on two males and one female from Mt Kinabalu in North Borneo. Male and female were figured in the original description. The type series is preserved in MNHN, and of the type series we designate one male as lectotype here (Figs 13–14). Lectotype ♂, here designated [examined], labeled "*tinna* Fruhst./Kina Balu, *ex* coll. H. Fruhstorfer/ MUSÉUM PARIS, 1934, COLL H. FRUHSTORFER/Lectotype ♂, *Euthalia tinna* Fruhstorfer, 1906 Designated by T. Yokochi, 1997", now housed in MNHN, Paris.

2) *Euthalia tinna agniformis* Fruhstorfer, 1906

Described based on three males and one female from Deli in North Sumatra. A female was figured in the original description, and it is clearly a *tinna*-type. A female of the type series is preserved in MNHN, but the other three males have not been located. We designate one female as lectotype here (Figs 21–22). Lectotype ♀, here designated [examined], labeled "Type (Red)/*tinna agniformis* Fruhst./Sumatra, Deli, *ex* coll. Fruhstorfer/MUSÉUM PARIS, 1934, COLL H. FRUHSTORFER/Lectotype ♀, *Euthalia tinna agniformis* Fruhstorfer, 1906, Designated by T. Yokochi, 1997", now deposited in MNHN.

3) *Euthalia tinna paupera* Fruhstorfer, 1906

Described from one male from the Malay peninsula, but it was not figured in the original description. The paper says that the holotype is in The Singapore Museum (all the materials there were transported to NUS in 1957), but we cannot find it. It was neither found in BMNH nor MNHN.

4) *Euthalia agnis modesta* Fruhstorfer, 1906

Described based on three females from Battak Mts in North Sumatra. They were not figured in the original description. The type specimens are clearly the *agnis*-type and preserved in MNHN, and we designate one female as lectotype here (Figs 7–8). Lectotype ♀, here designated [examined], labeled "Type (Red)/*agnis modesta* Fruhst./Sumatra, Deli, *ex* coll. Fruhstorfer/*agnis* [imb.] 13. IX. 93/MUSÉUM PARIS, 1934, COLL H. FRUHSTORFER/Lectotype ♀, *Euthalia agnis modesta* Fruhstorfer, 1906, Designated by T. Yokochi, 1997", now deposited in MNHN. We failed to find "Deli" in the map of Sumatra, but Fruhstorfer (1904) describes *Euthalia adonia sumatrana* based on one male from Montes Battak, and the holotype is labeled "Deli, Sumatra". Therefore, Deli is located in the Battak

Mts.

3. Fruhstorfer (1913)

Euthalia agnis (Snellen van Vollenhoven, 1862)
  ssp. *agnis* (W. Java)
  ssp. *modesta* (N. Sumatra)
Euthalia tinna Fruhstorfer, 1906
  ssp. *tinna* (N. Borneo)
  ssp. *agniformis* (N. Sumatra)
  ssp. *paupera* (the Malay peninsula)

Fruhstorfer (1913) again treated this complex as two species in Seitz vol. 9 on the basis of the presence of both species in Sumatra. And, in pl. 129, row b, he showed the figure of the male of *agniformis* described in 1906.

4. Corbet (1941)

Euthalia agnis: Corbet, 1941

Corbet (1941) compared *agnis* (Java) to *tinna* (Borneo), and he thought they were the same species.

5. Corbet (1945)

Euthalia agnis modesta: Corbet, 1945

Corbet (1945) showed *modesta* as a subspecies of *Euthalia agnis*. No figure was shown, but the male genitalia were presented.

6. Fleming (1975, 1983)

Euthalia agnis paupera: Fleming, 1975
Euthalia agnis paupera: Fleming, 1983

Fleming (1975, 1983) showed *paupera* from the Malay peninsula as a subspecies of *Euthalia agnis*. Male and female were presented, and the male was the *tinna*-type and the female was the *agnis*-type.

7. D'Abrera (1985)

Euthalia agnis paupera: D'Abrera, 1985
Euthalia agnis tinna: D'Abrera, 1985
Euthalia agniformis: D'Abrera, 1985

D'Abrera (1985) treated *paupera* and *tinna* as subspecies of *agnis*. He reported *agniformis* as an independent species, but later threw doubt in its status: "I am almost certain that *tinna* is synonymous with either *E. agnis* or most unlikely, with *E. merta*."

8. Otsuka (1988)

Euthalia agnis modesta: Ostuka, 1988

Otsuka (1988) said *Euthalia agnis modesta* was distributed in Borneo. But *modesta* is from North Sumatra and his specimen(s) should be called *tinna*, for there is no description of treating *tinna* as a synonym of *modesta* in the report. Male and female are figured (*tinna*-type).

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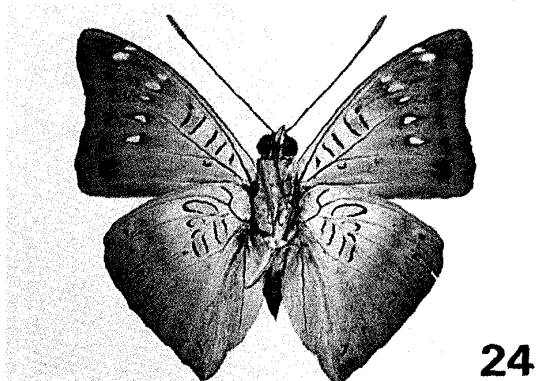
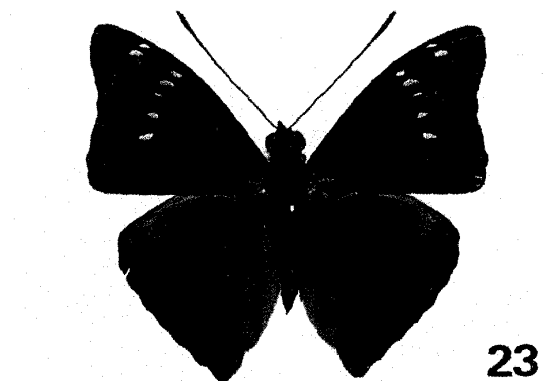
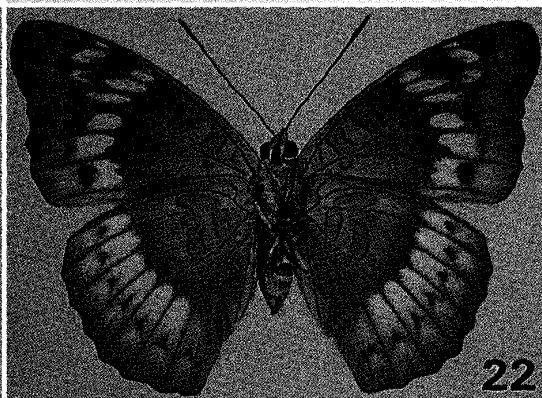
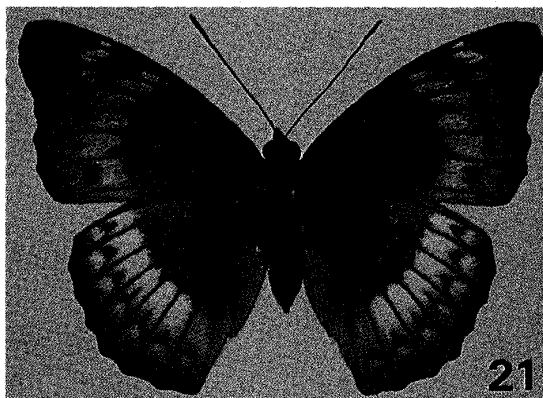
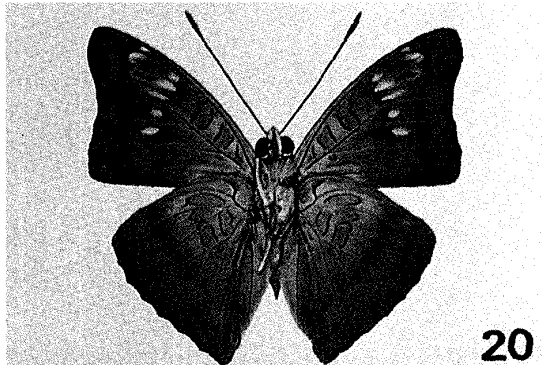
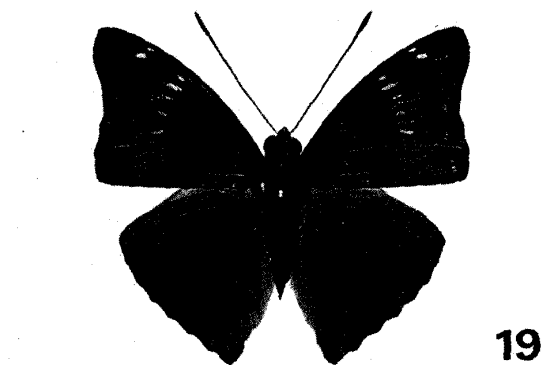
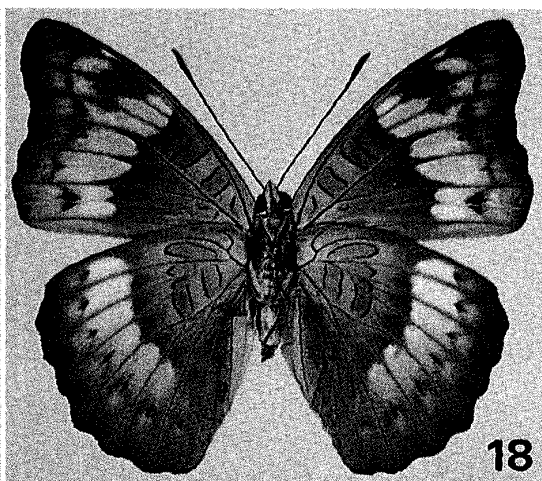
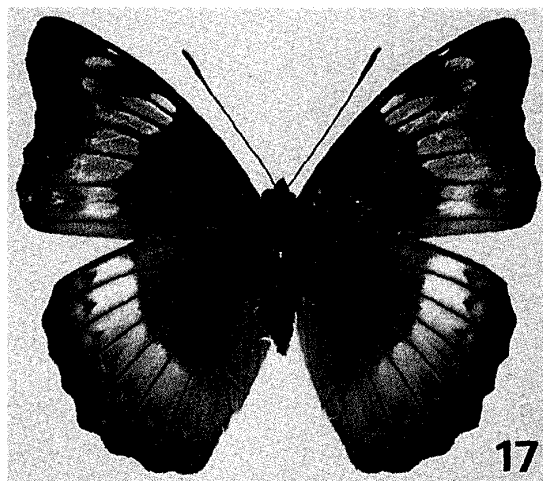
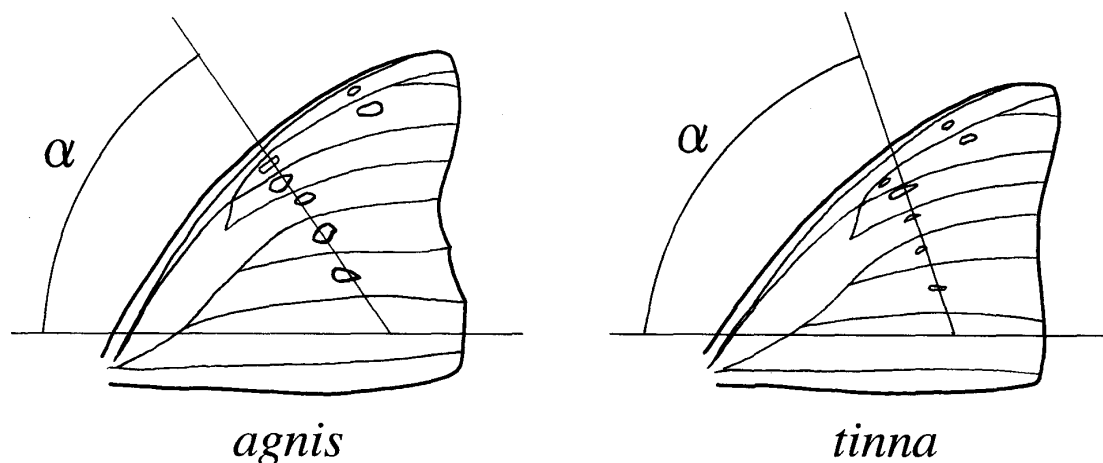


Fig. 25. Difference of angle (∠α) of white spots between *Euthalia agnis* and *E. tinna*.

9. Tsukada (1991)

Euthalia agnis (Snellen van Vollenhoven, 1862)
- ssp. *agnis* (Java)
- ssp. *modesta* (N. Sumatra)
- ssp. *canens* (S. Sumatra)
- ssp. *paupera* (W. Malaysia)
- ssp. *tinna* (Borneo)

Euthalia aconthea (Cramer, 1777)
- ssp. *purana* (Sumatra)
- = *agniformis*

Tsukada (1991) thought that *tinna* was a subspecies of *Euthalia agnis* from Borneo, and he treated *agniformis* as a synonym of *Euthalia aconthea purana* Fruhstorfer, 1906 from Sumatra. For that reason the figured male of *agniformis* in Seitz vol. 9, pl. 129 row b, by Fruhstorfer (1913) was thought to be *Euthalia aconthea* (Cramer, 1777). A male figured in pl. 110, fig. 1 in Tsukada (1991) was the *tinna*-type and two females in figs 2, 3 were the *agnis*-type. Furthermore, he described a new subspecies *canens* to South Sumatran *agnis*.

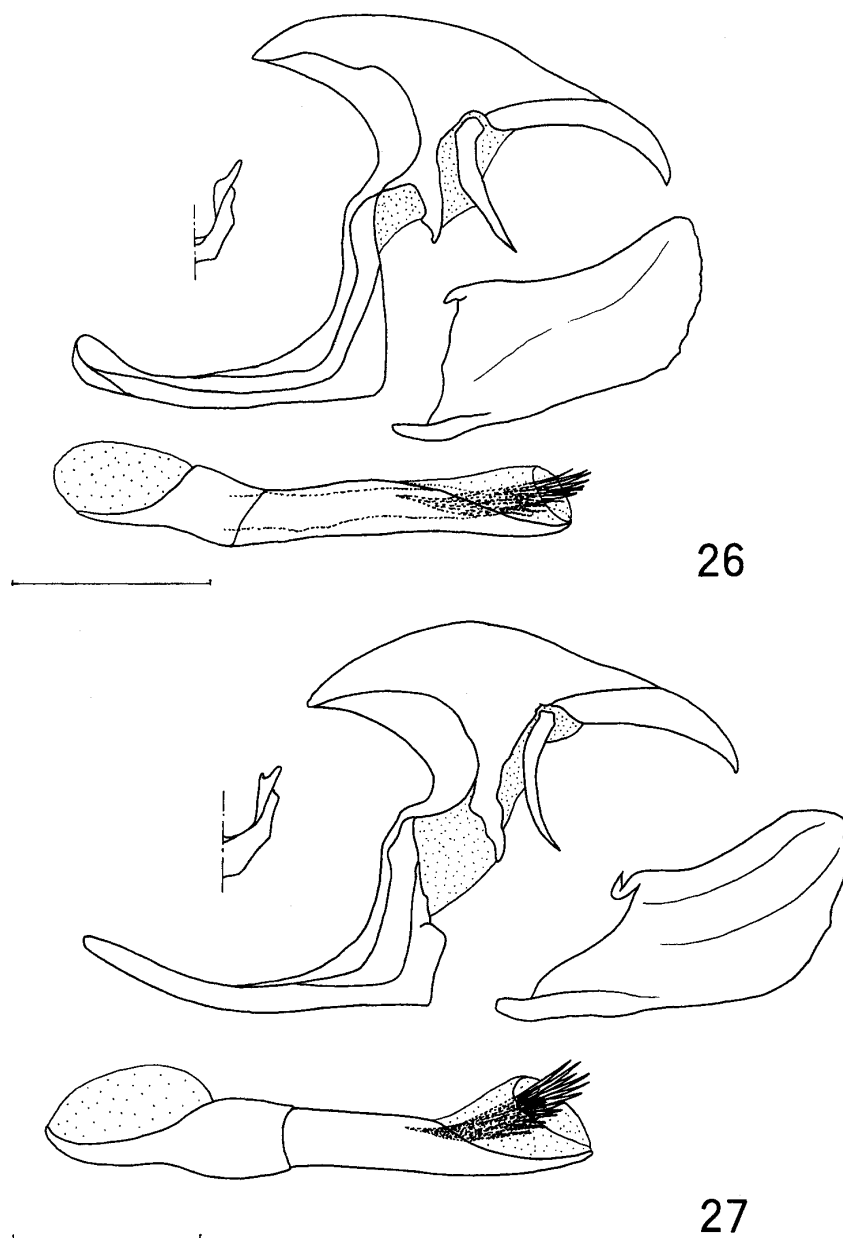
10. Eliot (1992)

Euthalia agnis paupera: Eliot, 1992

Eliot (1992) treated *paupera* as a subspecies of *Euthalia agnis*, and published a picture of a male and a female. The female is an *agnis*-type, but the male (although the figure is not so clear) seems to be a *tinna*-type.

Discussion

As mentioned above, Fruhstorfer (1906, 1913) repeatedly treated the *agnis* complex as two

Figs 17–24. *Euthalia* (*Euthalia*) *tinna* subspp. 17. *E. t. tinna*. W. Kalimantan, ♀, M. Kawai collection. 18. *Ditto*, underside. 19. *E. t. agniformis*. W. Sumatra, ♂, T. Yokochi collection. 20. *Ditto*, underside. 21. *E. t. agniformis*. N. Sumatra, lectotype ♀, MNHN. 22. *Ditto*, underside. 23. *E. t. paupera*. Ranong, S. Thailand, ♂, T. Yokochi collection. 24. *Ditto*, underside.

Figs 26–27. Male genitalia of *Euthalia* spp. 26. *E. agnis modesta* (S. Sumatra). 27. *E. tinna agniformis* (N. Sumatra).

species, *Euthalia agnis* and *E. tinna*, but since Corbet (1941) reported this as a single species, *E. agnis*, the classification has been thought to be standard. According to further revision of our collections and some references, this complex should be treated as two species as shown by Fruhstorfer (1906, 1913). We mention the reasons as follows:

1) Rediscovery of *tinna*-type male from North and West Sumatra

The specimens recorded from Sumatra up to now were all the *agnis*-type (referred to as ssp. *modesta*) except the type specimens of *agniformis*. A female type specimen of the taxon *agniformis* was a *tinna*-type (type of males untraced) and it was described by Fruhstorfer in 1906 from Sumatra. But its status has not been clear. Since we have now researched the type specimens and have the new record of *tinna*-type males corresponding to *agniformis* from

Fig. 28. Distribution map of *Euthalia agnis* (● [○: T. L.]) and *E. tinna* (▲ [△: T. L.]). 1. [Java]. 2. Mt Gede. 3. Sancan. 4. Mt Cermai (Ciremay). 5. Mt Slamet. 6. Mt Djeng. 7. Battak Mts. 8. Mt Sibayak. 9. Brastagi. 10. Mt Dempo. 11. Lampung. 12. Cameron Highlands. 13. [Mt Kinabalu]. 14. Crocker Range. 15. Mt Saran. 16. Kalo Hill. 17. Mt Sanggul. 18. [the Malay peninsula]. 19. Ranong.

North and West Sumatra, we can show that both types are distributed in Sumatra. As a result of this, *modesta* is a subspecies of *E. agnis*, and *agniformis* is a subspecies of *E. tinna*.

2) Discovery of *tinna*-type male from Ranong in South Thailand

Though Fruhstorfer (1906) treated *paupera* from the Malay peninsula as a subspecies of *E. tinna*, we have never seen the *tinna*-type specimens from the Malay peninsula. But it was thought to be that the figured males in Fleming (1975, 1983), Tsukada (1991) and Eliot (1992) were all *tinna*-type and females were *agnis*-type. Mr Tetsuo Miyashita (Tokyo) told us that a male in his collection was *tinna*-type. A male preserved by Yokochi is *agnis*-type and the female specimens that we have seen were all *agnis*-type. As the holotype specimen of *paupera* is untraced, and no figure was shown in the original description, it is unknown whether this taxon is *tinna*-type or *agnis*-type. But Fruhstorfer classified *paupera* as a subspecies of *tinna* in 1913, so it is highly probable that *paupera* is *tinna*-type. Recently, we obtained a *tinna*-type male specimen from S. Thailand, Ranong (Figs 23–24), and found that both types are distributed in the Malay peninsula, though the *tinna*-type female was unknown. Therefore, it would be reasonable to assume that the real *paupera* is a subspecies of *E. tinna* and the *agnis*-type is a new subspecies of *E. agnis*. Strictly speaking, the male specimen from Ranong we obtained is probably not from the same locality as the place where the type of *paupera* was collected and it is not improbable that our specimen differs from

paupera at a subspecific level, but we treat it as *paupera* for the time being.

Euthalia (Euthalia) agnis hiyamai ssp. nov. (Figs 9–12)

Euthalia agnis: Corbet & Pendlebury, 1956: 233, pl. 7, fig. 93; Eliot, 1978: 200, fig. 100.
Euthalia agnis paupera: Fleming, 1975: 51, pl. 48, N114 [*partim*]; Fleming, 1983: 53, pl. 48, N114 [*partim*]; D'Abrera, 1985: 357; Tsukada, 1991: 418, pl. 110, figs 2, 3 [*partim*]; Eliot, 1992: 187, pl. 27, fig. 31 [*partim*].

Male. Similar to ssp. *modesta*, but ground color is tinged with purple, especially on hindwing, on upperside; ground color in silver area is tinged with purple on underside. Length of forewing 27 mm.

Female. Similar to ssp. *modesta*, but ground color, especially on basal area, is pale brown and not tinged with black on upperside; white spots on forewing are smaller than those of ssp. *agnis*; white spots in spaces 4, 5 and 6 on forewing are separated from each other, but are in series in ssp. *agnis* and *modesta*. Length of forewing 32–33 mm.

Distribution. W. Malaysia.

Holotype. ♂, Cameron Highland, W. Malaysia, Mar. 1976. Paratypes. 1 ♀, Cameron Highland, Mar. 1976; 1 ♀, Cameron Highland, 1987; 1 ♀, Cameron Highland, 11, Dec. 1989. Holotype is now preserved in T. Yokochi collection and will be deposited in The Kitakyushu Museum & Institute of Natural History (Fukuoka, Japan) in future. Paratypes are preserved in T. Hiyama (Chiba, Japan) and T. Yokochi collections.

The new subspecies name *hiyamai* is dedicated to Mr Toyohide Hiyama.

Taxonomic status of *agniformis* and *canens*

After the original description of *agniformis* was published, only D'Abrera (1985) and Tsukada (1991) mentioned the taxon except Fruhstorfer (1913), and it has been classified as an independent species or as a synonym of *Euthalia aconthea purana*. Three males of the type series (3 ♂ 1 ♀) are now untraced and the specimens cannot be examined, but a male is figured in Seitz vol. 9. This figured male should be treated as *E. aconthea*, as Tsukada (1991) reported so. The other type of a female is now preserved in MNHN and is a *tinna*-type. The status of *agniformis* now becomes clear by designating the female as lectotype.

Tsukada (1991) classified the Sumatran specimens as *modesta* from North Sumatra and *canens* from South Sumatra, but it is difficult to separate them and *canens* can be thought of as a synonym of *modesta*. Furthermore, a female of *E. tinna* was recorded from West Kalimantan. It is possible that it is a new subspecies, but only a female was recorded and the figure is shown here (Figs 17–18).

Diagnosis between *agnis* and *tinna*

1. Wing shape and pattern

Male

(1) Anal angle of forewing is more protrusive in *agnis* than in *tinna*; anal angle of hindwing is not so protrusive in *agnis* as in *tinna*.

(2) Ground color is silver and shaded in *agnis*, dark brown in *tinna*.
(3) White spots on upperside of forewing are lined straight, but the angle of imagined line through these spots to the hind margin is acuter in *agnis* than in *tinna* (*agnis* < *tinna* in $\angle \alpha$ on Fig. 25). Size and shape of white spots are almost the same and rounder or sagittal in *agnis*, while shape of white spots is long and slender, and largest in space 5 in *tinna*.
(4) Purple area is revealed on space 7 of forewing in *agnis*, but it is absent or only has a slight trace in *tinna*.
(5) Ground color of hindwing is gray tinged with silver in *agnis*, but it is light brown in *tinna*.

Female

(1) Extent of concavity of outer margin on forewing is greater in *agnis* than in *tinna*.
(2) Ground color on upperside is black-brown and shaded in *agnis*, but is uniformly brown in *tinna*.
(3) Brown ground color of hindwing is lighter in *agnis* than in *tinna*.
(4) White spot in space 1b on forewing is absent or faded in *agnis*, but is clear in *tinna*.
(5) White band on hindwing is not seen or only a white area can be seen in spece 7 in *agnis*, while a large and clear white band is revealed in *tinna*.

2. Palpi

Same shape in both species, without needle on apex.

3. Antenna

Antennae are similar to each other. The upper surface of the apex is black and underneath is brown.

4. Male genitalia

As figured (Figs 26–27), the shape of valva is slightly different, but there are no distinctive differences between *agnis* and *tinna*.

Conclusion

As mentioned above, the *agnis* complex of *Euthalia* is classified into two species and four subspecies. Below we present a synonymic list as a conclusion.

Euthalia* (*Euthalia*) *agnis (Snellen van Vollenhoven, 1862)

Euthalia* (*Euthalia*) *agnis agnis (Snellen van Vollenhoven, 1862)

Adolias agnis Snellen van Vollenhoven, 1862: 202, pl. 12, fig. 2 (♀). Syntype(s) ♀, Indonesia: Java (RMNH, Leiden), [examined]; Snellen van Vollenhoven, 1862: 273; Butler, 1869: 602; Snellen, 1895: 20; Krikken, Achterberg, Doesburg, de Jong and Zwart, 1981: 262.
Euthalia agnis: Kirby, 1871: 253; Fruhstorfer, 1894: 245, pl. 18, fig. 8 (♂). 8♂ 3♀.
Euthalia agnis agnis: Fruhstorfer, 1913: 672, pl. 129, row a (♂ *agnis*), 129, row b (♀ *agnis*); Roepke, 1938: 326, pl. 33, figs 9 (♂), 13 (♀); D'Abrera, 1985: 357, figs 1st (♂: UP, UN), 2nd (♀: UP); Tsukada, 1991: 418, pl. 110, figs 4 (♀), 17, 18, 19 (♂), 20, 21, 22 (♀).
Euthalia agnis: Corbet, 1941: 810 [*partim*].

Distribution. W. Java, C. Java.

Euthalia (*Euthalia*) *agnis modesta* Fruhstorfer, 1906

Euthalia agnis modesta Fruhstorfer, 1906: 19. Lectotype ♀, Indonesia: Battak Mts, Sumatra (MNHN, Paris), [examined]; Fruhstorfer, 1913: 673; Corbet, 1945: 179, fig. 7 (♂ genitalia); D'Abrera, 1985: 357; Tsukada, 1991: 418, text-fig. (♂ genitalia), pl. 110, figs 5, 6 (♀), 7, 8 (♂).
Euthalia agnis canens Tsukada, 1991: 418, pl. 110, figs 9, 10, 11 (♂), 12 (♀). Holotype ♂, Indonesia: Mt Dempo, S. Sumatra (ET, Nagano), [examined]. **Syn. nov.**
Euthalia agnis: B. Hagen, 1896: 175.

Distribution. Sumatra.

Euthalia (*Euthalia*) *agnis hiyamai* Yokochi & Matsuda, **ssp. nov.**

Euthalia agnis: Corbet & Pendlebury, 1956: 233, pl. 7, fig. 93 (♂ genitalia); Eliot, 1978: 200, fig. 100 (♂ genitalia).
Euthalia agnis paupera: Fleming, 1975: 51, pl. 48, N114 (♀) [*partim*]; Fleming, 1983: 53, pl. 48, N114 (♀) [*partim*]; D'Abrera, 1985: 357; Tsukada, 1991: 418, pl. 110, figs 2, 3 (♀) [*partim*]; Eliot, 1992: 187, pl. 27, fig. 31 (♀) [*partim*].

Distribution. W. Malaysia.

Euthalia (*Euthalia*) *tinna* Fruhstorfer, 1906, **sp. rev**.

Euthalia (*Euthalia*) *tinna tinna* Fruhstorfer, 1906

Euthalia tinna Fruhstorfer, 1906: 18, figs (♂, ♀). Lectotype ♂, Malaysia: Kina Balu (=Kinabalu), N. Borneo (MNHN, Paris), [examined].
Euthalia tinna tinna: Fruhstorfer, 1913: 673, pl. 130, row a (♂ *tinna*).
Euthalia agnis tinna: Corbet, 1945: 182; D'Abrera, 1985: 357; Tsukada, 1991: 418, pl. 110, figs 13, 14 (♀), 15, 16 (♂).
Euthalia agnis modesta: Otsuka, 1988: 52, pl. 68, figs a (♂: UP, UN), b (♀: UP).
Euthalia agnis: Corbet, 1941: 810[*partim*].

Distribution. Borneo.

Euthalia (*Euthalia*) *tinna agniformis* Fruhstorfer, 1906, **stat. rev**.

Euthalia tinna agniformis Fruhstorfer, 1906: 18, fig. (♀). Lectotype ♀, Indonesia: Deli, Sumatra (MNHN, Paris), [examined]; Fruhstorfer, 1913: 673 [*partim*].
Euthalia agniformis: D'Abrera, 1985: 357.

Distribution. N. Sumatra, W. Sumatra.

Euthalia (*Euthalia*) *tinna paupera* Fruhstorfer, 1906, **stat. rev**.

Euthalia tinna paupera Fruhstorfer, 1906: 19. Holotype ♂, the Malay peninsula [untraced]; Fruhstorfer, 1913: 673.
Euthalia agnis paupera: Fleming, 1975: 51, pl. 48, N114 (♂) [*partim*]; Fleming, 1983: 53, pl. 48, N114 (♂) [*partim*]; Tsukada, 1991: 418, pl. 110, fig. 1 (♂) [*partim*]; Eliot, 1992: 187, pl. 27, figs 32 (♂), 100 (genitalia) [*partim*].

Distribution. W. Malaysia, S. Thailand.

Acknowledgments

We thank Mrs Nguyen Thi Hong of The Museum National d'Histoire Naturelle

Entomologie, Paris, Dr Rienk de Jong of the Nationaal Naturhistorische Museum, Leiden, Mr Etsuzo Tsukada of The Azumino Butterfly's Research Institute, Nagano, and Mr Mitsuo Kawai of The Gyokudo Museum, Tokyo, for making available to us the photographs of specimens including types. We are indebted to Mr Toyohide Hiyama, Chiba, for his generous loan of valuable materials for this study. Thanks are due to Mr Phil R. Ackery of The Natural History Museum, London, to Mrs Yang Chang-Man of The Department of Zoology of The National University of Singapore, to Mr Akihiro Araya, Akita, and to Mr Tetsuo Miyashita, Tokyo, for giving us valuable suggestions.

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摘　　要

いわゆる *Euthalia* (*Euthalia*) *agnis* (Snellen van Vollenhoven, 1862) (Rhopalocera, Nymphalidae) は2種に分けるのが適当である (横地　隆・松田英仁)

はじめに

塚田 (1991) によれば, *Euthalia agnis* はマレー半島, ボルネオ, スマトラ, ジャワ各地から記録され, いずれの産地でもかなりの稀少種である. 最近ボルネオ産亜種 *tinna* に類似した型 (以下, *tinna* 型とする) の♂個体が北部, 西部スマトラから複数得られたが, これらは従来スマトラより知られる亜種 *modesta* とは全く異なるものであった. また筆者の1人, 横地は南タイ産の *tinna* 型の♂個体と, ジャワ産 *agnis* に類似する型 (以下, *agnis* 型とする) のマレーシア・キャメロンハイランド産♂個体を所蔵している. つまりスマトラ, マレー半島では *tinna* 型と *agnis* 型が混棲していることになる. 本編では *agnis* 型と *tinna* 型を便宜的に *agnis* 群 (complex) と呼び, パリ国立自然史博物館 (昆虫部門) (MNHN), ライデン博物館 (RMNH), ロンドン大英博物館 (自然史) (BMNH), シンガポール国立大学動物学教室 (NUS) におけるタイプシリーズの調査に基づいて本群の分類を再検討した.

Agnis 群の分類の変遷

現在までに記載された本群は次の6タクサである (T. L.: 基産地).

agniformis Fruhstorfer, 1906 (T. L.: Deli, Sumatra)
agnis Snellen van Vollenhoven, 1862 (T. L.: Java)
canens Tsukada, 1991 (T. L.: Mt Dempo, S. Sumatra)
modesta Fruhstorfer, 1906 (T. L.: Battak Mts, Sumatra)
paupera Fruhstorfer, 1906 (T. L.: the Malay peninsula)
tinna Fruhstorfer, 1906 (T. L.: Kinabalu, N. Borneo)

以下に本群がどのような分類学上の位置で扱われてきたかを年代順に示す (シノニムリストも参照).

1. Snellen van Vollenhoven (1862)

Adolias agnis Snellen van Vollenhoven, 1862

Snellen van Vollenhoven (1862) は, 本群のタクソンとして初めて西ジャワから *agnis* を記載した. 原記載では♀が図示されているが, タイプシリーズの個体数は不明である. これ (ら) は RMNH に保管されており, 筆者らは確認している. レクトタイプの指定は行われていない.

2. Fruhstorfer (1906)

Fruhstorfer (1906) は *tinna* とその2亜種および *agnis* の1亜種の4タクサを記載した.

1) *Euthalia tinna* Fruhstorfer, 1906

北ボルネオのキナバル山を基産地として2♂1♀で記載された. 原記載では♂♀が図示されている. タイプシリーズは MNHN に保管されており, このうち1♂をレクトタイプとして本編で指定した(図13–14).

2) *Euthalia tinna agniformis* Fruhstorfer, 1906

北スマトラのデリを基産地として3♂1♀で記載された. 原記載では♀が図示されている (*tinna* 型). タイプシリーズのうち1♀のみが MNHN に保管されている. しかし, 残り3♂の個体は所在不明である. レクトタイプを♀として, その指定を本編でおこなった (図21–22).

3) *Euthalia tinna paupera* Fruhstorfer, 1906

マレー半島を基産地として1♂で記載されたが, 原記載に図示はない. ホロタイプはシンガポール博物館保管と記されている (同館の標本は1957年に全て NUS へ移管された) が, 発見できない. また BMNH, MNHN への移管も考えられたが確認できない (追跡不能).

4) *Euthalia agnis modesta* Fruhstorfer, 1906

agniformis と同一基産地である北スマトラのバタック山脈から 3♀で記載されたが，原記載に図示はない．タイプシリーズは MNHN に保管されており，*agnis* 型である．1♀をレクトタイプとして，その指定を本編でおこなった（図 7–8).

3. Fruhstorfer (1913)

Euthalia agnis (Snellen van Vollenhoven, 1862)
ssp. *agnis* (W. Java)
ssp. *modesta* (N. Sumatra)

Euthalia tinna Fruhstorfer, 1906
ssp. *tinna* (N. Borneo)
ssp. *agniformis* (N. Sumatra)
ssp. *paupera* (the Malay peninsula)

Fruhstorfer (1913) はザイツ第 9 巻でもこのように本群を 2 種として扱った．両種はスマトラで混棲しているとの見解である．またここで初めて 1906 年に記載した *agniformis* の♂個体を図示している (pl. 129, row b).

4. Corbet (1941)

Euthalia agnis: Corbet, 1941

Corbet (1941) はジャワ産 *agnis* とボルネオ産 *tinna* につき比較し，両者を同一種と考えた.

5. Corbet (1945)

Euthalia agnis modesta: Corbet, 1945

Corbet (1945) はスマトラ産 *modesta* を *agnis* の亜種として示した．標本の図示はないが♂ゲニタリアを示している.

6. Fleming (1975, 1983)

Euthalia agnis paupera: Fleming, 1975
Euthalia agnis paupera: Fleming, 1983

Fleming (1975, 1983) はマレー半島産 *paupera* を *agnis* の亜種として示した．♂♀が図示されているが，♂は *tinna* 型，♀は *agnis* 型である.

7. D'Abrera (1985)

Euthalia agnis paupera: D'Abrera, 1985
Euthalia agnis tinna: D'Abrera, 1985
Euthalia agniformis: D'Abrera, 1985

D'Abrera (1985) は *paupera* と *tinna* を *agnis* の亜種とした．また *agniformis* を独立種として記述したが，その扱いに確証を持っていない．*tinna* は *agnis*（あるいは *Euthalia merta*）と同一種ではないかと考えたためである.

8. 大塚 (1988)

Euthalia agnis modesta: Ostuka, 1988

大塚 (1988) はボルネオ産を *agnis* とし，亜種名に *modesta* を充てた．しかし *modesta* は北スマトラを基産地としており，*tinna* を *modesta* のシノニムとする記述もないことから，本来は *tinna* とすべきである．♂♀の個体が図示されている（*tinna* 型).

9. 塚田 (1991)

Euthalia agnis (Snellen van Vollenhoven, 1862)

ssp. *agnis* (Java)
ssp. *modesta* (N. Sumatra)
ssp. *canens* (S. Sumatra)
ssp. *paupera* (W. Malaysia)
ssp. *tinna* (Borneo)

Euthalia aconthea (Cramer, 1777)
ssp. *purana* (Sumatra)
= *agniformis*

塚田 (1991) は，*tinna* を *agnis* のボルネオ亜種とし，*agniformis* を *Euthalia aconthea* のスマトラ亜種 *purana* のシノニムとして扱った．Fruhstorfer (1913) による Seitz, vol. 9, pl. 129, row b に図示された *agniformis* ♂が *Euthalia aconthea* と考えられるためである．

塚田 (1991) における pl. 110, fig. 1 の♂は *tinna* 型で，figs 2, 3 の♀は *agnis* 型である．また南スマトラ産に新亜種名 *canens* を与えた．

10. Eliot (1992)

Euthalia agnis paupera: Eliot, 1992

Eliot (1992) はマレー産を *paupera* として記し，1♂1♀を図示した．このうち1♀は *agnis* 型であるが，1♂は（やや写真の鮮明さに欠けるものの）*tinna* 型と思われる．

考　案

以上の変遷をみると，Fruhstorfer (1906, 1913) は *agnis* 群を種 *tinna* と種 *agnis* の2種としたが，その後 Corbet (1941) が *agnis* の1種として以来，この分類が一般的となっている．しかし今回までに筆者らが入手した標本，資料に基づき検討を加えたところ，本群は Fruhstorfer (1906, 1913) の分類に準じて2種に分けるのが以下のような理由から適当と考えられる．

1) 北部，西部スマトラより *tinna* 型♂の再発見

従来より得られていたスマトラ産の個体は *agniformis* のタイプ標本を除いて全て *agnis* 型（亜種 *modesta* とされる）であった．この例外の *agniformis* の♀タイプ標本は *tinna* 型（♂タイプ標本は不明）であり，Fruhstorfer が1906年にスマトラより記載したものである．しかしその後 *agniformis* の分類学的位置は曖昧のままとされてきた．今回筆者らはタイプの調査を行うとともに，*agniformis* に相当する *tinna* 型の♂個体を初記録として北部，西部スマトラより入手できたため，同島に両型が分布することを確認できた．つまり *modesta* は種 *agnis* の亜種，*agniformis* は種 *tinna* の亜種として整理される．

2) 南タイ・ラノンより *tinna* 型♂の発見

Fruhstorfer (1906) はマレー産 *paupera* を *tinna* の亜種としているが，筆者らはマレー半島産の *tinna* 型の標本をこれまで実見していなかった．ただし，Fleming (1975, 1983), 塚田 (1991), Eliot (1992) での図示標本は♂は全て *tinna* 型，♀は *agnis* 型と考えられる．また宮下哲夫氏（東京）の私信では，彼のコレクションのマレー産1♂は *tinna* 型であるとのことである．ところが筆者のひとり，横地の所有する1♂は *agnis* 型であり，♀も現在まで *agnis* 型しか見ていない．前述のように *paupera* のタイプ標本は所在不明で，原記載には図示もなく，これが果たして *tinna* 型か *agnis* 型かは不明である．しかし，後に Fruhstorfer (1913) が本タクサを *tinna* に分類していることから，*paupera* が *tinna* 型であることは間違いないと思われる．今回筆者らははじめて *tinna* 型の♂を南タイから入手したことで，*tinna* 型の♀は未知ではあるものの，マレー半島にも両型が分布することを確認できた．つまり真の *paupera* は種 *tinna* の亜種，マレー半島産の *agnis* 型は種 *agnis* の新亜種（*hiyamai* ssp. nov., 図9–12）として整理するのが自然であろう（厳密に言えば，今回発見の♂個体は *paupera* の基産地とは離れた産地に由来することも考えられ，亜種レベルで同一視できない可能性も残されているが，ここでは *paupera* に含めて扱うこととする）．

原記載以後 *agniformis* に触れたのは，Fruhstorfer (1913) 以外には D'Abrera (1985) と塚田 (1991)

のみであり，それは独立種とされたり *Euthalia aconthea purana* のシノニムとされたりしてきた．タイプシリーズ3♂1♀のうち，3♂は所在不明で実見できないが，Seitz vol. 9 に図示があり，この♂は種 *aconthea* とみるべきと考える．実際，塚田（1991）も同様の扱いをしている．1♀はMNHNに保管されており *tinna* 型である．この1♀をレクトタイプに指定することで，*agniformis* の分類学的位置が明確になる．

塚田（1991）はスマトラ亜種を北スマトラの *modesta* と南スマトラの *canens* に分けているが，両者を区別するのは困難であるため，ここでは *canens* を *modesta* のシノニムとした．

さらにボルネオ，西カリマンタンより種 *tinna* の♀が記録された．新亜種の可能性があるが，1♀のみの記録であるため，図示（図17-18）に留めておく．

Euthalia (*Euthalia*) *agnis* (Snellen van Vollenhoven, 1862)

ssp. *agnis* (Snellen van Vollenhoven, 1862) (図1-4)
　分布．W. Java, C. Java.
ssp. *modesta* Fruhstorfer, 1906 (図5-8)
=*canens* Tsukada, 1991, syn. nov.
　分布．Sumatra.
ssp. *hiyamai* Yokochi & Matsuda, ssp. nov. (図9-12)
　分布．W. Malaysia.

Euthalia (*Euthalia*) *tinna* Fruhstorfer, 1906, sp. rev.

ssp. *tinna* Fruhstorfer, 1906 (図13-18)
　分布．Borneo.
ssp. *agniformis* Fruhstorfer, 1906, stat. rev. (図19-22)
　分布．N. Sumatra, W. Sumatra.
ssp. *paupera* Fruhstorfer, 1906, stat. rev. (図23-24)
　分布．W. Malaysia, S. Thailand.

種 *agnis* と種 *tinna* の形態学的差異

1. 翅斑

♂

(1) 翅形は *agnis* の場合 *tinna* に比べ，前翅肛角の張り出しが強いのに対し，*tinna* は後翅前角の張り出しが強い．
(2) 両種とも翅表の色調は黒茶色だが，*agnis* ではやや紫がかり，濃淡のめりはりがはっきりしている．
(3) 両種とも前翅表の白斑列は一直線に並ぶが，図25で示す角度 α が *agnis*<*tinna* となる．また，白斑個々の形は *agnis* では個々の白斑の大きさがほぼ同一で類円形もしくは楔形となるのに対して，*tinna* の場合横に細長くなり，第5室のものが最も大きくなる．
(4) *agnis* は後翅表第7室を中心に藤紫色を呈するが，*tinna* では認めないか，もしくは非常にうすい．
(5) 翅裏は地色が *agnis* では灰白色であるが，*tinna* では茶色である．

♀

(1) 翅形は *agnis* の場合 *tinna* に比べ，前翅外縁中央の凹みが強い．
(2) 翅表の地色は *agnis* では黒茶色がとくに強く，濃淡の差があるが，*tinna* の場合ほぼ均一の茶色．
(3) 翅裏の地色は両種とも茶色であるが，色調は *agnis* のほうが明るい．
(4) 前翅の白斑列は *agnis* では消失するか薄くなるが，*tinna* では第1b室に明瞭である．
(5) 後翅は *agnis* では第7室にわずかの白色部分を有するのみであるが，*tinna* の場合大きく明瞭な白帯を有する．

2. パルピ

両種とも同一形で，先端部に針状突起はない.

3. アンテナ

両種とも同一で，先端部の表面は黒色，裏面は褐色を呈する.

4. ♂ゲニタリア

図 26 (*E. agnis modesta*, S. Sumatra), 図 27 (*E. tinna agniformis*, N. Sumatra) に示すように，valva の形状にやや差があるものの，両種に基本的な相違は見られない.

まとめ

筆者らが得た標本，各博物館の所蔵標本および文献に検討を加え，いわゆる *Euthalia* (*Euthalia*) *agnis* (Snellen van Vollenhoven, 1862) (Rhopalocera, Nymphalidae) は種 *agnis* と種 *tinna* の 2 種に分けるのが適当であるとした.

(Accepted October 23, 1998)

Published by the Lepidopterological Society of Japan,
5-20, Motoyokoyama 2, Hachioji, Tokyo, 192-0063 Japan